BRUSHLESS EXCITER WITH ELECTROMAGNETICALLY DECOUPLED DUAL EXCITATION SYSTEMS FOR STARTER-GENERATOR APPLICATIONS

ABSTRACT

[0039] A synchronous electric machine having a rotor member and a stator member having a stator core is provided. The electric machine further includes a main machine having a direct current (DC) rotor field winding mounted on the rotor member; and a dual (AC/DC) excitation system. The excitation system includes a rotatable polyphase armature winding in electrical communication with a rectifier assembly for conducting direct current to the rotor field winding of the main machine, and a plurality of DC salient poles and at least one alternating current (AC) salient pole both included in the stator core. A magnetic axis of respective AC field coils is disposed substantially in electromagnetic space-quadrature relation with respect to magnetic axes of adjacent DC field coils, wherein when the respective AC field coils are energized, an alternating current is induced in the polyphase armature winding for providing excitation to the main machine.